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forded them for productive work. An interesting suggestion in this connection has been made by Professor Cattell. In a letter to the New York *Evening Post*³ he proposed that there should be a division of the office by the appointment of both a president and a chancellor. The general idea underlying the proposal is that the president should be the leader of the faculty in educational affairs and that the chancellor should represent the university locally and before the world. It is to be hoped that questions of this nature will continue to be discussed freely and frankly both by university presidents and professors. The subject might perhaps be discussed profitably by the Association of American Universities. That body should, however, realize, as a preliminary to any discussion, that there can be no real association of American universities in which the faculties of the universities are not represented.

J. E. CREIGHTON

CORNELL UNIVERSITY.

REPORT OF THE PERMANENT COMMISSION
OF THE INTERNATIONAL SEISMOLOG-
ICAL ASSOCIATION

THE writer attended the conference held at Zermatt, Switzerland, August 30 to September 3, 1909, as the delegate for Canada. It was well attended. Of the twenty-three countries forming the association twenty were represented, as follows: Austria, Belgium, Bulgaria, Canada, Chile, Denmark, England, France, Germany, Greece, Hungary, Italy, Netherlands, Norway, Portugal, Roumania, Russia, Servia, Spain and Switzerland. Regret was expressed that the United States did not send a representative. Besides the delegates, other scientists were present, making the total in attendance 42.

Professor A. Schuster presided, and Dr. Hepites, of Bukarest, was elected vice-president for the remaining two years, when the general meeting will be held in July, 1911, at Manchester, England.

³ October 5, 1901.

Mention may be made of several reports of committees appointed at The Hague meeting in 1907. The one on bibliography recommended that arrangements be made with the International Catalogue of the Royal Society for the publication in one volume of all papers on seismology.

The committee on "Catalogue," *i. e.*, for the publication of the catalogue for the earthquakes of 1906, held several meetings before a compromise was effected between different views on the character of classification, regional or chronological. Considerable expense is involved in the preparation of a catalogue, hence its contents should serve scientific ends especially.

From the report two years ago to this association of The Hague meeting it will perhaps be recalled that makers of instruments had been invited to submit for competition a simple seismograph, with magnification forty to fifty and costing in the neighborhood of seventy-five dollars. The testing of the apparatus was to be done at the Central Bureau at Strassburg, and the award was entrusted to a committee of five members. Three instruments were submitted and subsequently tested. The committee on instruments found that the terms of competitions had not been rigorously adhered to; that the price set for an efficient instrument was too low and not in keeping with the precision required in seismological work of the present day; that however good work had been done by the manufacturers for the above seventy-five dollars; and that no prize be awarded, but instead the money, some \$250, be equally divided between the three manufacturers, in a measure as compensation for their efforts. Emphasis was laid in the report on the fact that the first consideration of a scientific instrument is efficiency; the cost being a secondary consideration.

Nearly every country represented presented a report on its respective seismological service.

Of the numerous papers presented there were several of particular interest. Professor Hecker presented the results of his ob-

servations, extending over a period of nearly seven years, of the deformation of the earth under the influence of the moon. The instrument (or instruments, for two were set up) used was a horizontal pendulum, in short a seismograph, placed in a well some eighty feet deep to eliminate the heat effect of the sun. As the theoretical displacement of a pendulum through the attraction of the moon is a definite quantity, readily computed for an absolutely rigid earth, the actual displacement gives a measure of the yielding of the earth itself, *i. e.*, of the degree of rigidity. Hecker's observations confirmed previous determinations made however by different methods, that the rigidity of the earth is somewhat greater than that of steel. The tide of the solid earth is from four to six inches. An interesting point brought out too was, that there is very little lag in this earth tide, *i. e.*, that "high earth" corresponds to the transit of the moon for any place.

Another interesting paper was that of Prince Galitzin on the determination of the azimuth or direction of the epicenter from the comparison of the corresponding amplitudes of two horizontal pendulums at a single station, one mounted in the N.-S., the other in the E.-W. direction. He showed the inter-agreement of his deduced azimuth for a dozen known earthquake centers with the theoretically computed one.

The method of obtaining the distance to an epicenter has of course for some time been readily available from the time interval between the different phases of an earthquake record; for instance, between the arrival of the first longitudinal waves and the first transverse waves; or the first long waves.

Of any individual question or subject discussed, the one on microseisms elicited the most interest. These microseisms or earth tremors have been observed practically over the whole earth, and are quite distinct from pulsations produced by earthquakes. They last for hours and days, and have a period of about five seconds. The actual amplitude (half range) of the earth particles reaches five

microns, or one two-hundredth of a millimeter.

The writer communicated the results of his investigation extending over several years, which shows that they are due in the first instance to areas of low barometer, surrounded by steep gradients, and in the second place, that such an area of low barometer is far more effective in producing microseisms when it is resting or passing over water, that is, the ocean. Experience shows that for the Atlantic coast the microseisms appear more strongly *after* the area of low has passed the recording station and reached the ocean. Per contra, in Europe the reverse should obtain, as in general atmospheric movement between Canada and Europe is easterly, that is, the microseisms there should show themselves *before* the low reaches the land.

A special committee was appointed to further investigate this interesting problem, and to that end it is probable that one or more instruments, especially designed for the purpose, will be set up on the seashore to record the pulsations of the water.

The present mareographs or tide-gauges are not adapted for that purpose, the time-scale being far too small, for one must be able to read at least to five seconds of time on the record. A thousand Marks, or \$250, was placed at the disposal of this committee.

The conference was successful in every respect. The members were all housed in the same hotel, and this enhanced the opportunity of "heart to heart" talks which are really the most valuable assets that meetings of scientific men offer.

OTTO KLOTZ

THE GRADUATE SCHOOL OF AGRICULTURE

THE fourth session of the Graduate School of Agriculture, which has been in progress for the past four weeks at the Iowa State College at Ames, was brought to a close July 29.

The session was entirely successful from the standpoint of numbers enrolled and character of the lectures given. The total enrollment was 207, in this number 39 states, the